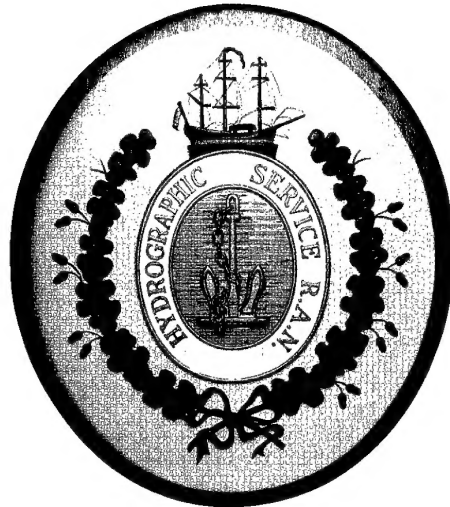


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ROYAL AUSTRALIAN NAVY

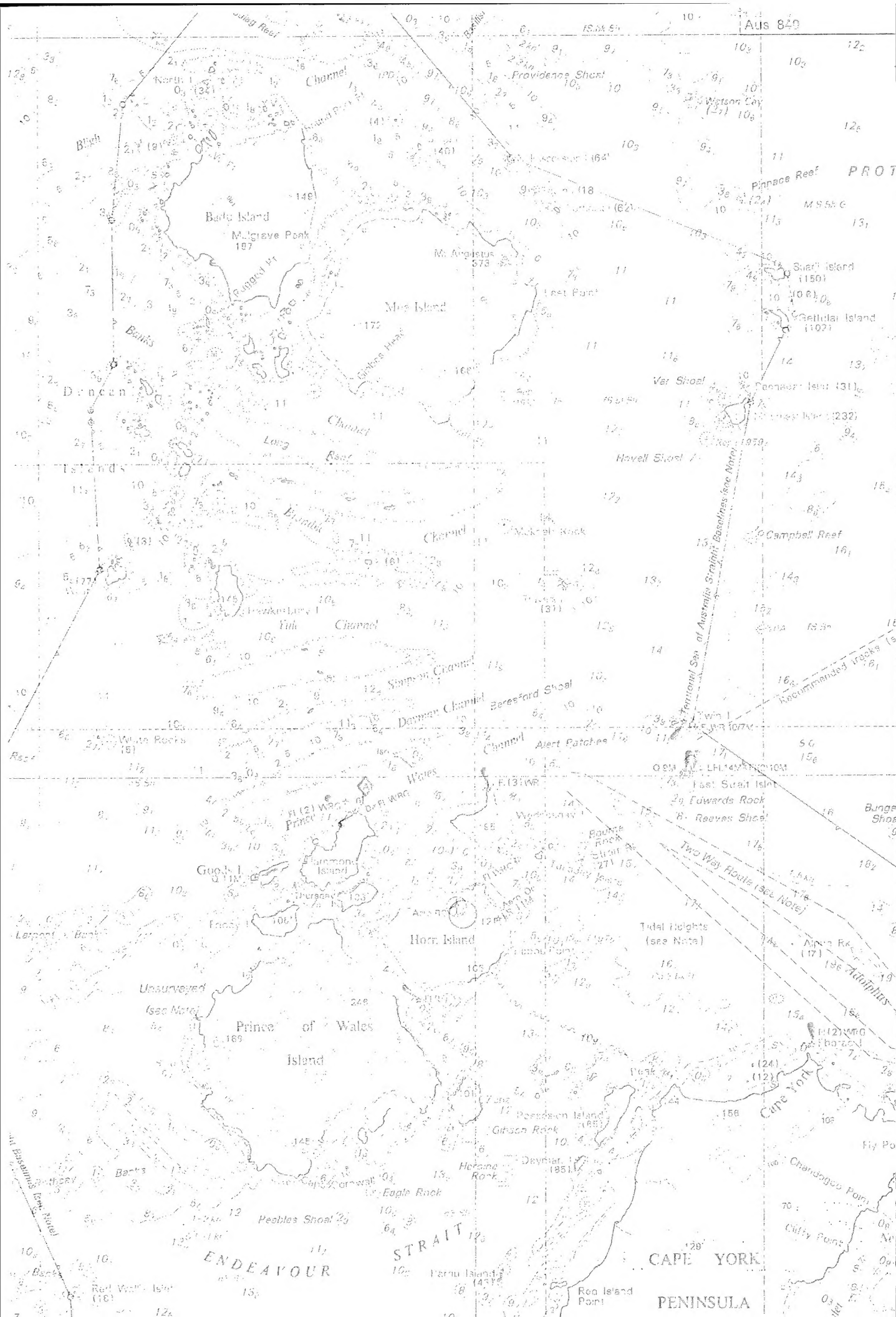
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1995 - 1996

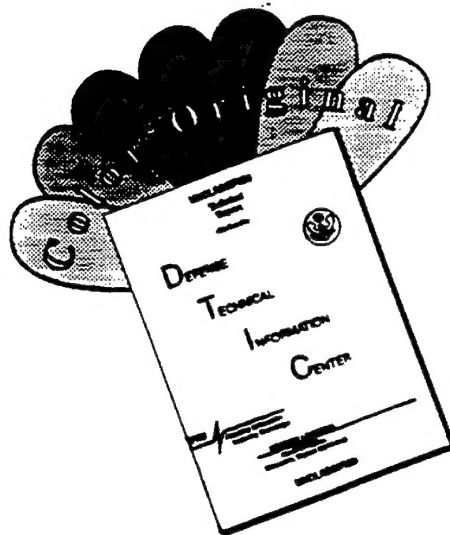
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**HYDROGRAPHIC SERVICE**  
**Royal Australian Navy**  
**ANNUAL REPORT 1995 - 1996**

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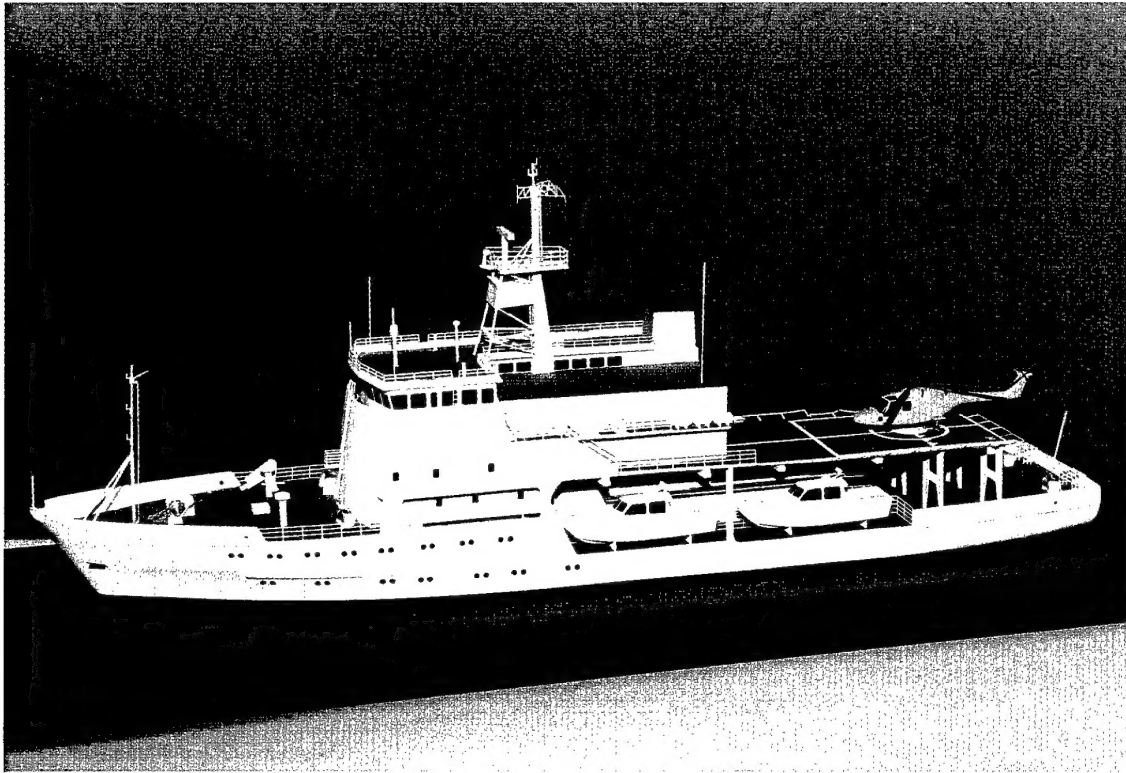
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## Model of New Hydrographic Ships



Contracts were signed with North Queensland Engineers and Agents (NQE), Australia of Cairns, for the construction and initial follow-on support for two 71m, 2550 tonne Hydrographic Ships and associated equipment on 2 April 1996. The names of the ships are to be HMAS LEEUWIN and HMAS MELVILLE. Delivery of LEEUWIN is planned for mid 1998 and MELVILLE should be completed some six months later. The ships are to be based at Darwin.

## Hydrographer's Foreword



*Commodore Willis was appointed Hydrographer RAN on 22 December 1995. He joined the Royal Australian Navy in 1967 and specialised in hydrographic surveying. He is a graduate in surveying, holds a Masters degree in Management Economics from the University of New South Wales and is a Fellow of the Australian College of Defence and Strategic Studies. He has held a range of senior staff and command appointments in the Hydrographic Service, and in Navy Headquarters, Canberra.*

I am pleased to present the 32nd Annual Report of the RAN Hydrographic Service. This report continues the record of discovery and charting of the Australian coast and continental shelf commenced a few centuries ago. During the year, the Service celebrated its founding on October 1920, 75 years ago. More than coincidentally, 1995 was also the 200th Anniversary of the Hydrographic Service of the Royal Navy, the predecessor of the RAN Hydrographic Service.

1995/96 was the first full financial year of operation of the Hydrographic Office in Wollongong. The 75th Anniversary celebrations conducted in October 1995 included visits by HMA Ships MORESBY and FLINDERS and involvement of the Wollongong community. The Office invited the local community to an open day during the Illawarra Festival in March 1996, reflecting greater involvement with the community since the relocation.

The Hydrographic Service continues its prominent role in international affairs through its involvement in the International Hydrographic Organisation. Two meetings of key IHO committees were held in Wollongong during the year. The Data Base Working Group met in February 1996 to finalise Edition 3 of the IHO Transfer Standard for Hydrographic Digital Data. The Permanent Working Group on Cooperation in Antarctica met in March 1996 to finalise the international charting scheme for Antarctic waters. The latter meeting was attended by a number of national Hydrographers or their deputies.

The core business of the Service was progressed with a number of significant surveys for both commercial and defence use being completed. The versatility of the LADS Unit as an immediately deployable asset was demonstrated during Exercise K95, where the Unit conducted surveys for littoral operations during the Exercise. 13 new charts and numerous other products were published.

A contract for the construction of two new Hydrographic Ships was signed in April 1996. These ships will enter service from 1998, replacing MORESBY and FLINDERS. The Office contribution to Project Sea 1430 for the Digital Hydrographic Data Centre has focussed on preparation of the Statement of Requirement due for release to industry late in 1996. Steady progress was made with the Raster charting service. The first edition of this service is due for release in early 1997.

All of these achievements would not be possible without the contributions of a number of people. The crews of the surveying units and the Office staff have made excellent contributions, despite staffing shortfalls, to ensure objectives are achieved. Their contributions are the subject of this report.

Commodore John Leech retired from the Navy in early 1996. His term as Hydrographer was fruitful for Australia and I wish him well for his retirement.

A handwritten signature in black ink, appearing to read 'R.J. Willis'.

R.J. Willis  
Commodore RAN

## **Corporate Overview: Hydrographic Service RAN**

**Background:** The RAN Hydrographic Service is the Commonwealth Government Agency responsible for the publication of nautical charts and other information required for the safety of ships navigating in Australian waters.

The Hydrographic Service has its origins in the British Admiralty Hydrographic Office, which was established in 1795. The Admiralty carried out surveys and published charts of the Australian coast throughout the 19th century in support of the defence and commercial development of the colonies. The RAN assumed responsibility for hydrographic surveys in 1920, and for the publication of charts in 1942. In 1946 the Federal Cabinet made the Commonwealth Naval Board responsible for the surveying and charting of Australian waters. This responsibility was confirmed in 1988 after a review of Commonwealth mapping activities.

### **Vision**

The Hydrographic Service will enjoy a world wide reputation of excellence as Australia's national hydrographic authority.

### **Mission**

The Hydrographic Service collects, manages and distributes hydrographic information to:

- 1) enable safe navigation,
- 2) support Australia's defence and the national infrastructure, and
- 3) satisfy international obligations for navigational safety.

### **Roles**

- To provide information to the Australian Defence Forces for military operations, as part of the National Defence Infrastructure.
- To provide navigation services to facilitate maritime trade for the economic benefit of Australia, as part of the National Transport Infrastructure.
- To provide navigation services in response to International Conventions for the Safety of Life at Sea and the Protection of the Marine Environment.
- To manage the National Hydrographic Data Base, and to provide data services to assist in the management and sustainable development of Australia's maritime zones, as part of the National Spatial Data Infrastructure.
- To co-ordinate Australia's hydrographic policy and services, both nationally and internationally.

## **Corporate Objectives**

- To carry out hydrographic surveys.
- To publish, maintain and distribute official nautical charts and other nautical publications.
- To manage the National Hydrographic Data Base.
- To develop capabilities to provide new and improved services.
- To participate in the international co-ordination and development of hydrographic services.



## **GEOGRAPHIC AND HYDROGRAPHIC SUPPORT**

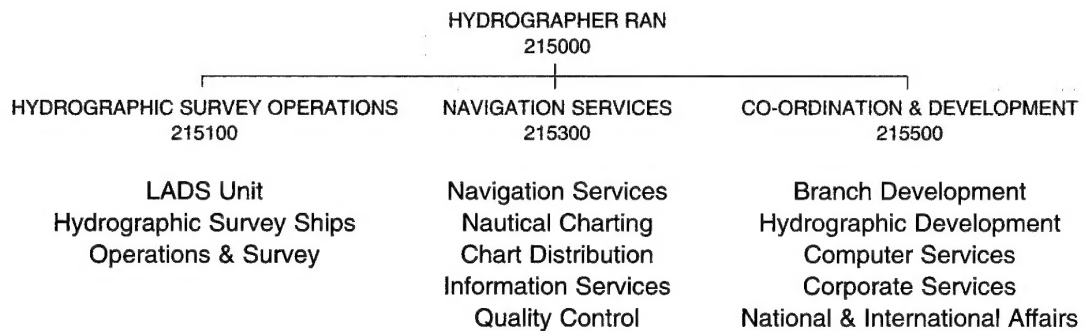
### **Component 215000**

**Manager: Hydrographer RAN**

Under Program Management and Budgeting, the responsibilities of the RAN Hydrographic Service for national and defence hydrography fall within the Geographic and Hydrographic Support Component of Navy's Combat Forces (Maritime Operations) Sub-Program. This Sub-Program is managed by the Maritime Commander Australia.

## **GEOGRAPHIC AND HYDROGRAPHIC SUPPORT**

**(215000)**



## REPORTS

### 1. Hydrographic Survey Operations

#### Manager: Director Hydrographic Operations



*Commander Hudson joined the Royal Australian Navy in 1970, and saw early service in HMA Ships BAYONET, TORRENS and MELBOURNE. Commander Hudson joined the Hydrographic Service in 1978 and has served in HMA Ships FLINDERS, MORESBY and COOK. He has completed Royal Navy Long Hydrographic Course and attended the RAN Staff College and commanded the Fijian survey ship HMFS RUVE, HMA Ships BETANO and MORESBY and had an extended posting with the Laser Airborne Depth Sounder Project. Commander Hudson served as Head Operations and Surveying until taking up the post of Director Hydrographic Operations in 1996 relieving Captain Geraghty.*

#### **Role**

The acquisition and assessment of hydrographic data from RAN surveying units and other commercial and public agencies.

#### **Elements**

Hydrographic Office Operations planning section

Hydrographic Survey Force Ships and Units

#### **Objectives**

Achieve 10 000 square nautical miles of survey per annum to appropriate International Hydrographic Organisation standards.

(From 1999 when replacements for HMA Ships MORESBY and FLINDERS are available this will

increase to 23 000 square nautical miles).

#### **Performance Indicators**

Although the stated objective is to achieve 10 000 square nautical miles of survey, this must be tempered by scale requirements and complexity of individual tasks and hence both total area coverage and percentage completion of the assigned tasks are reported as measures of performance.

Surveying activities are promulgated through the hydrographic surveying plan "HYDROSCHEME" which is considered by the Defence Geographic Requirements Committee in about May each year.

### Hydrographic Survey Operations

#### **Survey Program 1995/96**

The RAN rolling three year surveying and charting plan "HYDROSCHEME", is developed through consultation within the Department of Defence and with various international and national maritime authorities. This plan is currently revised on an annual basis and promulgates the Service's proposed survey plan for the immediate future. The attached figures indicate the work undertaken during the financial year. The achievement of surveys against HYDROSCHEME is outlined at Annex B and depicted in Figure 1.

## **HMAS MORESBY**

After an extended refit HMAS MORESBY commenced a survey in Investigator Strait, SA, in mid September and progressed the task through to late November 1995. During this period, the ship paid a 10 day visit to Sydney and Port Kembla to participate in Navy Week and the 75th Anniversary celebrations of the RAN Hydrographic Service. The survey aimed to achieve modern coverage of the centre of the Investigator Strait for deep draught vessels using Port Stanvac. Also during this period HMAS MORESBY survey motor boats and crews were detached to Port Lincoln to complete a modern survey of the approaches into the port. At the end of the survey period MORESBY was tasked at short notice to perform operations near Kangaroo Island in support of the COLLINS class submarine project.

Following the Christmas period MORESBY sailed for a four month deployment to the Sahul Banks and Bathurst Island region, north of Darwin. After a short survey at Cambridge Gulf, W.A. to confirm a shoal's Low Tide Elevation for a base line revision and a visit to Darwin, a boat camp was established at the southern end of Bathurst Island at the aboriginal community of Nugui. Survey operations were progressed using the Navy's permanent Sercel HFDGPS station recently established in the Northern Territory which permitted very good positional accuracy to be achieved much further offshore than has been possible with older techniques. MORESBY also trialled the new Fugro OMNISTAR wide area DGPS.

In late April, MORESBY made a goodwill visit to Singapore and Jakarta. In Jakarta many past friendships were renewed and new ones made with officials from the Indonesian Navy and fellow hydrographers from the Department of Hydrography and Oceanography. The Ship returned to the Sahul Banks region in early May, recovered the boat camp and returned to Fleet Base West on 24 May for a maintenance period and leave before the start of the next surveying season in August 1996.

## **HMAS FLINDERS**

HMAS FLINDERS has had a busy year completing three major surveys off the Queensland coast in the approaches to Gladstone, Shoalwater Bay and East Cay to Boot Reef plus commencing a survey in the approaches to Millingimbi adjacent to Arnhem Land. Over 10 000 miles of line sounding was achieved and over 22 000 miles were steamed in total, despite manning shortages and a reduction in time on the survey grounds.

The survey in the approaches to Gladstone was conducted by the ship concurrently with the Shoalwater Bay survey by the ship's survey motor boat, SMB DUYFKEN. The SMB was detached for the duration of the period, July-November 1995 with FLINDERS assisting in some larger areas. During this period, the ship visited Brisbane, Sydney for Navy Week (28 September - 5 October), and Port Kembla for the Hydrographic Service RAN 75th Anniversary and Gladstone.

The East Cay to Boot Reef survey concentrated on the Pandora Entrance area which will abut a future outer Great Barrier Reef route survey being undertaken by the Australian Maritime Safety Authority (AMSA). In early April 1996, FLINDERS re-traced the route thought to have been taken by Captain Wilhelm Jansz in 1606 from Albatross Bay near Weipa to Turu Cay in the western approaches to the Torres Strait.

### **HMA Ships MERMAID and PALUMA**

At the end of June 1995 both MERMAID and PALUMA proceeded to conduct survey operations in the vicinity of Lizard Island. The aim was to improve the charting of one existing route from the outer to inner reef, develop a second route and explore a number of other entrances in the area through the outer reef. Due to the complex nature of the seabed, survey progress was limited to proving the existing route and finding good passage to the Coral Sea. In addition PALUMA completed a benchmark survey of four discreet areas in support of LADS operations, in the vicinity of the Sir Charles Hardy Group of islands.

Between September and October both SML's visited Cairns for maintenance, ending in an Operational Training Period on 16 October. On 17 October, MERMAID and PALUMA proceeded to Torres Strait to commence operations in the vicinity of Sue, Poll, and Bet Islands, at the southern end of the Great North East Channel, prior to the Christmas lie up and assisted Maintenance Period.

The ships returned to the survey grounds in early January to complete previous operations, provide tidal support for LADS and examine existing vigias in Torres Strait; on completion, course was set for Cumberland Passage to prove a route through from central Torres Strait passing Cumberland and Hibernia Channels, Maer Island and Flinders Entrance to the Coral Sea. The survey period proved most interesting and at times hazardous with operations being completed on 1 April.

The period 4 April to 30 June was spent alongside Cairns before sailing on 1 July for survey operations in the vicinity of the Whitsunday Islands.

### **HMA Ships SHEPPARTON and BENALLA**

At the beginning of the period both ships were surveying near Mornington and Bountiful Islands in the Gulf of Carpentaria. The majority of the latter months of 1995 involved leave, refit and maintenance activities in Cairns.

1996 commenced with survey activities in the northern area of the Great Barrier Reef between Cape Melville and Cape Weymouth. This survey mainly involved investigation of shoals in an area identified from a recent LADS survey as suitable for an alternative shipping route to the current charted Inner Route. Very close correlation was found with the LADS data, and the route's potential was confirmed.

Weather conditions at various times during the period limited effective sounding time. Of particular note in March 1996 was the eye of Cyclone Ethel passing over both ships at anchor in the Flinders Group. While all attempts were made to avoid Ethel, the cyclone's unpredictability proved them futile. Little damage was caused to the survey infrastructure and the ships rode well at anchor. Notwithstanding the weather both ships were able to complete the majority of their work.

Both vessels were in Cairns at the end of the period undertaking maintenance, leave and preparations for future survey operations in Joseph Bonaparte Gulf.

### **Laser Airborne Depth Sounder (LADS) Unit**

From July to December 1995 the LADS Unit continued the surveys of Cairns North, Cape Weymouth to Blackwood Channel and Torres Strait. In addition a number of minor tasks were conducted which included Yule Entrance and reconnaissance work at Flinders Entrance. A reconnaissance was also conducted from Darwin over the Sahul Banks; during this forward deployment a geodetic network was observed in the Darwin area to coordinate the DGPS Site within HMAS COONAWARRA. LADS participated in Exercise K95 as a Blue Force unit, and surveyed the site of the amphibious landing at Groote Eylandt. The unit visited Cooktown to celebrate the 225th anniversary of James Cook's fortuitous passage through Providential Channel which had been recently surveyed by LADS. The unit also deployed south to RAAF FAIRBAIRN and NAS NOWRA to display the system in Canberra, and participate in the Hydrographic Service 75th Anniversary celebrations. A very successful year culminated in the award of the Maritime Commander's Hydrographic Efficiency Shield to the LADS Unit.

1996 commenced with a LADS course to train newly joined operators, and the survey of Cairns North was progressed. A short forward deployment to Coffs Harbour was conducted to survey Elizabeth and Middleton Reefs however, uncharacteristically this task was only partially completed due to defects. In May the unit deployed to Darwin for three months to conduct survey operations over the Sahul Banks.

During the period a number of system enhancements were implemented. An A1 plotter was procured for the portable processing system or Porta-GASS, an external aircraft cooling pod was fitted and optical disks have replaced the aging Kennedy tape drives. An additional pilot has been obtained to increase productivity to four flights every week. The rate of rendering LADS surveys was also improved, with 5 major surveys and 10 minor tasks forwarded to the Hydrographic Office in the period. Over the 12 months a total of 2800 square nautical miles were sounded.

### **Hydrographic Office Detached Survey Unit (HODSU)**

For the period 1995/96, HODSU completed the field operational phase of Beachcomber 95 on 4 July, returning to Sydney the same month. From 10-27 October HODSU was deployed to Cairns to conduct HI226-Swallows Landing. The report was rendered in November 1995 utilising the units recently acquired data logging system GEONAV/GEOCOMP.

HODSU's 1995/96 Antarctic season involved the completion of the survey of the Approaches to Davis. This survey was undertaken from 03 Jan to 07 Mar 1996 using the Antarctic Survey Vessel (ASV01).

Preparation and reconnaissance for Beachcomber 1996 took place during March and April with the operational phase to be conducted during June/July 1996.

### **Tidal Section**

The work of the Tides and Geodetic Section includes production of the Australian National Tide Tables (ANTT), as well as Solomon Islands and Vanuatu Tide Tables. The Section also provides tidal and geodetic support for cartographic work, survey operations and special projects.

The first digital edition of the ANTT was released at the end of 1995. The digital version provides predictions for secondary ports as well as standard ports with a graphical display of the tidal curve. The electronic tide tables have been received enthusiastically by the RAN fleet and the public. Some upgrading of the product is planned for the 1997 version.

The Tides and Geodetic Section is also working on incorporating information on tides and other time varying objects into the Electronic Navigational Chart.

The Section cooperates closely with the National Tidal Facility at the Flinders University in Adelaide. A cooperative project with James Cook University of Townsville and with the Australian Institute of Marine Science is being developed with the aim of producing a definitive model of tidal stream circulation in North Queensland.

## **RAN Hydrographic School**

The Hydrographic School has completed a busy year as the Service expands to meet the requirements of the new ships. A total of seven major courses have been conducted. Fifty three students attended these courses, five of whom came from overseas countries (New Zealand two, Malaysia two, and Indonesia one).

The Director of the TNI - AL (Indonesian Navy) Hydrographic and Oceanographic School visited the Hydrographic School in March. The opportunity was taken to exchange training material and procedures.

Successful trials of the MICROFIX short range position fixing system were conducted in early May. Judging by the trials, the system promises to provide accurate and stable performance. Initial training was provided simultaneously by the Contractor.

### **Assessment Against Performance Indicators**

<i>Unit</i>	<i>Days at sea as a % of days away from base port</i>	<i>Miles sounded as a % of miles steamed</i>	<i>Area completed as a % of area allocated</i>
MORESBY	95%	44%	90%
FLINDERS	88%	46%	92%
MERMAID	92%	28%	84%
SHEPPARTON	93%	21%	50%
PALUMA	97%	26%	84%
BENALLA	95%	21%	50%
LADS	N/A	N/A	74%
HODSU	57%	N/A	95%

The total area surveyed during 1995/96 was 5468 square nautical miles.

## **2. Navigation Services**

### **Manager: Director Hydrographic Operations**

#### **Role**

The provision of marine navigation information, and the delivery of customer services and products related to safety of navigation at sea.

#### **Objectives**

To provide timely delivery of services and products to the Australian Defence Force (ADF) and maritime community.

To produce sufficient products and services to a standard that will meet Australia's needs for safe navigation in Australian and Papua New Guinea waters.

#### **Elements**

Nautical Charting  
Navigational Services  
Information Services  
Chart Distribution

#### **Performance Indicators**

The extent to which products and services are supplied to satisfy the ADF and maritime community's navigation needs.

#### **Nautical Charting**

The Nautical Charting Element had a successful and productive year in providing various navigational products to the Fleet and the maritime community in general. Highlights during the year included the following:

- Production of 13 New Charts, 2 New Editions and 3 Fleet Charts.
- Reprinting of 183 revised charts - stock quantity totalled 93,402 charts.
- Reprinting of 31 unrevised charts - stock quantity totalled 13,940 charts.
- Screen printing of 101 charts - stock quantity totalled 35,496 charts.
- Scanning of 138 charts under the Raster Digital Chart Project (see below).

The Raster Digital Chart Project, under which suitable chart reprostat is scanned into a Raster digital format, was commenced in the Element during 1995. This Project will allow for the replacement of conventional chart film reprostat with a digital format which will be easier to update and maintain. It will also enable the release of the digital data in the form of a Raster Chart CD which will provide a screen based navigation chart to the mariner.

The Army Topographical Support Establishment (formally the Army Survey Regiment) resumed printing operations in early October 1995. Prior to this a private contractor reprinted charts from April to October 1995 while the Army unit underwent restructuring.

## **Navigational Services**

Maintaining up-to-date charts continues via the weekly issue of Notices to Mariners (see Annex D). The Element has also responded to queries from authorities and the public on a range of issues from place names and maritime features, to general depth data. Progress towards a national set of Sailing Directions is continuing. An increasing demand on the section is the support required for data associated with maritime boundaries. The section supplied nomenclature data for offshore features to the secretariat of the Committee for Geographical names in Australia for inclusion in the digitally based Gazetteers of Australia.

## **Information Services**

Hydrographic information was received by the Information Services group resulting from 110 new activities and projects by the Hydrographic Service and other sources. In time this data will be used on some 70 primary charts on the national chart scheme. Requests for RAN hydrographic data from authorities and commercial organisations increased over the period to 64 and interest in digital bathymetry represented 76% of total requests received.

The Hydrographic Service wishes to acknowledge publicly the contributions made by the Port and Marine authorities of the Australian States and Territories in providing survey information for the charts of all the major ports in Australia. See Annex E for contributions and acknowledgments.

## **Quality Control**

The Quality Control (QC) Section appraised 35 RAN Hydrographic Survey Force surveys consisting of data from major survey operations and minor additional taskings. Subsequently 45 survey tasks were verified and approved for charting action, including some survey's which were appraised in the previous year.

To enhance service to the Hydrographic Survey Force, the QC section has commenced the compilation of a CD which contains hydrographic surveying reference documents and processing software. The aim of the CD will be to reduce the number of separately issued media, both manuscript and digital, and provide a single reference source. The initiative will also reduce document production costs and amendment delays.

## **Library**

The Hydrographic Library is now fully operational and provides full on-line services to the Defence Library Network. The service is permanently staffed by a Librarian in charge of the special collection of materials including IHO and IMO publications, serials, books and articles. The Library also contains CD-ROM's covering hydrography, oceanography, electronic charting, maritime law, geography, management, computing, boundaries and seamanship.

## **Chart Distribution**

Four new businesses were appointed as chart agents within FY 1995/96. These business are located in Airlie Beach (Qld), Whyalla (SA), Balnarring (Vic) and North Essendon (Vic). Visits to the four chart agents located in Darwin (NT) and the agent in Port Lincoln (SA) were conducted during the period.

During the fiscal year a new distribution programme was put into operational use. The Distribution Processing System (DPS) is now the principal means of distributing New Charts (NC), New Editions (NE) and New Publications (NP). The DPS automatically identifies, invoices (including dispatch labels) for any product identified as new edition, chart or publication. Use of the DPS has resulted in the completion of customer standing orders generally within twenty four hours of the arrival of any NE, NC and NP product. Originally intended for the automatic maintenance of RAN vessel's folio holdings, following several enhancements, the DPS is now capable of actioning the standing order requirements for the entire customer base.



A single freight contractor was appointed during the fiscal year to provide the Hydrographic Service with road and air (domestic and international) courier services. An effective reduction in freight & administrative costs has resulted from this appointment. A Freight Management System, provided by the freight contractor has greatly improved the Distribution Centre's freight operations.

For the year, the supply of British Admiralty & New Zealand products were restricted to chart agents located with New Zealand, Papua New Guinea, Solomon Islands and Vanuatu, this decision is the reason for the marked reduction of British Admiralty and New Zealand sales as shown in Annex A.

During the fiscal year, considerable time has been devoted to the development of the Sales and Marketing Plans for the forth coming Australian Digital Charts in Hydrographic Chart Raster Format (HCRF). These plans have been formulated mindful of the considerable number of responses received following the November 1995 distribution of the pre - release CD of 45 Australian charts in HCRF.

### **Assessment Against Performance Indicators**

Thirteen new charts and two new editions were produced during the FY 95/96. Additionally the ADF was supported with the production of three fleet charts and a number of miscellaneous graphics.

The inter-services arrangement and program for chart printing was maintained with 210 charts reprinted during the period, of which 177 required revision and 33 went unrevised (direct reprinting for restocking purposes).

The Nautical Charting Element has maintained support to Navigational Services through the preparation of 33 block chartlets issued in weekly Notice to Mariners. Cartographically prepared overlays for screen printing purposes has been an on-going commitment during the year with 101 charts being corrected by the process. Stock corrected totalled 35,496.

640 Notices to Mariners were issued over the period.

### 3. Co-ordination And Development

#### Manager: Director Co-ordination & Development



*Ken Burrows joined the Hydrographic Office as a cartographer in the late 1950s. He compiled many of the more complex charts around Australia and was responsible for introducing computers into hydrography in the mid 1970s. He was also largely responsible for the successful concept implemented as AUTOCHART, the chart production system still in use today. His ideas on hydrographic information, and initiatives for progressing the development of an electronic chart display and information system, have resulted in Australia being a world leader in the development of electronic charting. In 1993 Ken Burrows was awarded an O.A.M. for his services to marine cartography. He has been the Director Co-ordination & Development since 1988.*

##### **Role**

Component wide aspects of planning, resourcing and co-ordination of hydrographic, surveying and cartographic operations and information management. Servicing and promoting the national activities of the Component.

##### **Objectives**

Supply the long-term planning and co-ordination of resources for tasks necessary to meet strategic guidance and national responsibilities.

Promote the Hydrographer's national and international role in hydrography.

Provide development and investigation services to meet specific program requirements with minimum disruption to operational areas.

##### **Activities**

Hydrographic Development

Branch Development

Corporate Services

National and International Affairs

##### **Performance Indicators**

The number of development initiatives successfully implemented. The ability to meet international commitments affecting the national role of providing maritime geographic and hydrographic information.

The degree to which essential planning and project tasks can be performed without impinging on resources available to the operating areas.

The ability to provide management information on resource utilisation and control.

#### **Branch Development**

The Hydrographic Service, through the Branch Development Section, has been an active participant in the preparation of Edition 3 of the IHO Transfer Standard for Digital Hydrographic Data (S-57) and continues to provide the secretariat for the IHO Colours & Symbols Working Group that has produced Appendix 2 to the Colour & Symbol Specification for ECDIS (S-52). Australia also provided a team leader to the Catalogue Harmonisation Sub Groups to the IHO-DGIWG Harmonisation Working Party on the alignment of IGO S57 with the DIGEST data standard.

Similarly, the Hydrographic Service also plays an active part in the Standards Association of Australia within the Sub-committee IT/4/S/1 - Geographic Information - The ECDIS Panel. Contact is also maintained with other groups dealing with geographic information such as the ISO Technical Committee 211, the Standards Association of Australia Committee on Geographic Information IT/4 that is also involved with the development of the Australian Spatial Data Transfer Standard, and with the Intergovernmental Committee of Surveying and Mapping.

The Section also represents the Hydrographic Service on the Technical Sub-Committee to the Inter-Departmental Committee on the Law of the Sea.

A ChartStation implementation team was formed in July 1995 to compile Standard Operational Procedures (SOP) for the operation of ChartStation in a production environment. To test these procedures conversion from AutoChart digital data and compilation from source material have been undertaken. The production of the first Derived Paper Charts (DPC's) are due in Sept 96. In addition, the SOP's have been reviewed and updated in preparation for the release of S-57 Edition 3 later this year.

The Survey Data Centre (SDC) continued its program to incrementally populate the digital survey information base. Development of a set of standard formats covering incoming digital data is currently being carried out. A digital database, the Manuscript Management Index (MMIndex), was developed and implemented within the Information Services Branch to manage the metadata of source hydrographic survey documents.

The Navigation Marks Data Centre (NDC) has continued to progress while awaiting formalisation of S57 Edition 3, with progressive data entry and a software upgrade. Amalgamation of data sets between the NDC and ChartStation to produce both DPC's and Electronic Nautical Chart products was achieved and minor changes to automate and enhance this process are nearing completion.

A Raster Data Centre (RDC) was established for the digital updating and maintenance of paper chart reproformat and the supply of Electronic Chart System data to the maritime community. Close to 40% of the Australian Chart Series has been scanned which releases staff for the compilation of increased Australian Chart Coverage. An additional benefit is that the RDC will also be able to provide an electronic chart service - Australian Digital Chart Series.

ECDIS trials at sea were successful and a trial system incorporating charts in both raster and vector format has been deployed on HMA Ships BRISBANE and MORESBY.

The year saw an increase in demand for Hydrographic information for many purposes and a consequent increase in requests for permission to use copyrighted Commonwealth charting products. The Service met most requests for information for commercial purposes through conditional licensing arrangements. Non-commercial requests were met in accordance with the Commonwealth Spatial Data Policy.

The Office of the Australian Government Solicitor has continued to support the Service with the provision of counsel in the areas of international, copyright and commercial law.

### **Hydrographic Development**

Hydrographic Development activities primarily focus on ship and system resources, and operating standards and procedures required to support the through life management of hydrographic data.

Tender evaluation and contract negotiations for the two new hydrographic ships occupied much of the Section's resources throughout the year. Both ships will be fitted with "state of the art" technology, including single and multi beam echo sounders and side scan sonars with full sensor, navigation and computer system integration and tailored data processing functionality. Staffing of a project to re-equip Survey Motor Launches (SML) to similar hydrographic equipment standards has commenced.

The SML HYPRO hydrographic data processing system has been enhanced following experience gained during its first year in service. System operators are well pleased with the system which is meeting expectations.

Laser Airborne Depth Sounder (LADS) development has concentrated on the provision of a visualisation tool to enable quality control of LADS digital data, the amount being too great for traditional methods of checking. Development of a birefringence filter, to enable LADS operations in full daylight, and turbidity modelling continues.

Other system developments and minor projects provided replacement and new equipment for most vessels. Items include: Racal Microfix II, Klein 595 Side Scan Sonars, Optus MobileSat telephone and facsimile facilities in all hydrographic ships, two Trimble Centurion "P" code Global Positioning System (GPS) receivers for ECDIS demonstrations, Ashtech Geodetic GPS Receivers.

The Section assisted the Department of Industrial Development in optimising the "Petrel" Three Dimensional Forward Looking Sonar (TDFLS) of Thomson Sintra Pacific. TDFLS provides instantaneous ensonification of the volume of water ahead of a vessel, including the sea floor, within each transmission. In addition to its use in contributing to safety of navigation, Petrel has been identified as having the potential to meet hydrographic survey feature detection requirements at speeds up to 12 knots. This offers a considerable improvement over current system capabilities and is to be the subject of a series of evaluation trials.

Significant resources have been applied to the continuing development of Zones of Confidence which will replace the Reliability Diagram on published charts. Specifications have been published and are being refined as work concentrates on their inclusion in IHO S-57, Data Quality Standards. The RAN Hydrographic Service continues to be an active member of the Working Group drafting the 4th Edition of IHO S-44, Standards for Hydrographic Surveys.

Section staff represented the Hydrographer on a number of committees and matters including Geographic Requirements Committee Core Sub-committee, EGICS, GHISA, AMSA liaison, Future Warfare Officer's Development Study, Project SEA 1430 (Digital Hydrographic Database) and ICSM Geodesy Group.

### **Computer Services**

Although there was a significant loss of staff resulting from the move to Wollongong, the tasks and responsibilities have increased dramatically. Besides System and Network Administration and Maintenance the group is also responsible for the majority of Hydrographic Office requirements in the rapidly expanding communications area. The appointment of a Systems and Network Administrator has resulted in the efficient running of the local area network and smooth migration to a Windows based computing environment in compliance with Navy IT standards. Notable accomplishments over the past year have been the connection to the Restricted High Naval Information Network and stand alone connection to the Internet for research and world wide e-mail facilities.

### **Corporate Services**

The Hydrographic Office relocation to Wollongong has continued to have a significant impact on operations of the Corporate Services group. Major milestones which occurred during the year relating to the relocation include the finalisation of the Defect Liabilities Period, which occurred in October 1995, and substantial progress towards the implementation of standard maintenance contracts for Fixed Plant & Equipment and general Building & Facilities Maintenance. These are being developed with the assistance of the Navy Facilities Commercialisation Project. A number of deficiencies relating to the building design and performance are yet to be resolved and will be the subject of attention over the next year.

Recruitment action has proceeded towards recovering from the staff losses experienced during the Office relocation. It is expected that staffing levels will return to approved levels, limited only by available funding, within the next two years. During this period incremental changes to the organisational structure are planned to accommodate the transition towards digital chart production and maintenance. During the year the office provided work experience opportunities for students from the Wollongong area for the first time.

Expenditure allocations for the forthcoming year have been substantially reduced and action has been taken to review activities and to employ a stringent financial management regime in order to ensure that the allocations will not be exceeded while minimising the impact of the reductions on core activities.

The activities of the Corporate Services section were disrupted to some extent during the year by the absence of the Manager of Corporate Services position for a significant part of the year.

## National and International Affairs

Hydrographic Service personnel participated in the activities of the following national bodies during the year:

- Inter-Governmental Advisory Committee on Surveying and Mapping
- Maritime Service Advisory Committee - Navigation Safety
- Permanent Committee on Tides and Mean Sea Level \*
- Steering Committee for the National Tidal Facility \*
- Co-ordinating Committee of Commonwealth Marine Science Agencies
- Commonwealth Spatial Data Committee, and its sub-committees
- Standards Australia Users Panel on ECDIS
- Hydrographic Commission, Institution of Surveyors Australia/Australian Hydrographic Surveyors Panel\*
- Association of Australian Ports & Marine Authorities (AAPMA) Hydrographic Surveyors Group\*
- The Hydrographer chairs these committees, and secretariat support is provided by the RAN Hydrographic Service.
- Heads of Commonwealth Marine Agencies.

Throughout the year RAN Hydrographic Service staff continued to take an active role in the various activities of the International Hydrographic Organisation (IHO), making significant contributions in the work being carried out by a number of IHO Committees and Working Groups. These were notably the South-West Pacific Hydrographic Commission (SWPHC), Permanent Working Group on Cooperation in Antarctica (PWGCA), Committee on Electronic Data (COE) - renamed Committee on Hydrographic Requirements for Information Systems (CHRIS), Worldwide Electronic Navigational Chart Data Base Committee (WEND), Working Group (WG) on Quality of Data, Working Group (WG) on Standards for Hydrographic Survey S-44, WG on Copyright of Charts and other Nautical Publications, and the Tidal Working Group.

Visit details associated with these and other international conferences are outlined below:

16-20 Jul 95	5th South East Asian & 36th Australian Surveyors Congress, Singapore	Mr R.A. Furness Mr J.S. Randhawa
3-9 Sep 95	17th International Cartographic Conference Barcelona, Spain	Mr R.A. Furness
14-20 Sep 95	41st meeting of the IMO Navigation Safety Sub Committee London, UK	CDRE J.W. Leech Mr K.G. Burrows
27-29 Sep 95	2nd SWPHC Conference Nuku'alofa, Tonga	CDRE J.W. Leech
2-13 Oct 95	IHO COE Data Base WG Object Catalogue Workshop Ottawa, Canada	Mr B. Pillich
16-20 Oct 95	IHO-DGIWG Harmonisation Working Group, Brest, France	Mr A. Keown
16-17 Oct 95	Workshop on "Tides in ECDIS" Dartmouth, Canada	Mr B. Pillich
23-27 Oct 95	IHO COE Data Base WG Meeting, Brest, France	Mr C.S. Roberts Mr B. Pillich

27-30 Nov 95	IHO COE (Committee of the Electronic Chart), Monaco	Mr K.G. Burrows
2-9 Feb 96	IHO CHRIS Data Quality WG, Data Base WG, and Transfer Standard Maintenance WG Meetings, Wollongong, Australia	Hydrographic Office Staff
27-29 Feb 96	IHO WEND Meeting, Tokyo, Japan	CDRE R.J. Willis Mr K.G. Burrows
4-7 Mar 96	IHO PWGCA Meeting, Wollongong, Australia	CDRE R.J. Willis Mr K.G. Burrows
22-25 Apr 96	IHO Tidal WG Meeting, Monaco	Mr B. Pillich
23-26 Apr 96	IHO CHRIS Colours & Symbols WG Meeting, Hamburg, Germany	Mr C.S. Roberts
21-24 May 96	Five Nations Mapping, Charting & Geodesy Conference, Wellington, New Zealand	CDRE R.J. Willis

The RAN Hydrographic Service hosted the 3rd PWGCA Meeting at its Office in Wollongong. The nations represented were Argentina, Australia, Chile, France, Germany, India, New Zealand, Norway, Russian Federation, South Africa, UK and Ukraine. The International Hydrographic Bureau (Monaco) was represented by Rear Admiral G. Angrisano. Representatives from Scientific Committee on Antarctic Research (SCAR), Council of Managers of National Antarctic Programs (COMNAP), Australian Antarctic Division, Australian Geological Survey Organisation and the Centre for Maritime Policy of the University of Wollongong also attended the meeting as observers. The aim of the meeting was to approve the international charting scheme for the Antarctic area, which was unanimously endorsed by the participants.

### **Assessment Against Performance Indicators**

All International commitments affecting the national role of providing marine geographic and hydrographic information were met during the period, which included participation in many IHO/IMO meetings, hosting two IHO Working Groups and continuing support to Project Sea 1430.

The continuing demand from various sources for digital data increasingly places pressure on coordination and development resources.

## Annex A

## Finance And Accounts

## Statement of Revenue and Expenditure

## Hydrographic Office Managed Appropriations

*Hydrographic Office Account Group 215000*

Expenditure \$M	\$M
Hydrographic Operations (215100)	7.12
Navigations Services (215300)	0.6
Coordination and Development (215500)	5.4

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<b>Total</b>	<b>13.13</b>
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Revenue \$M	\$M
Net Sales	-1.4

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<b>Total Account Group 215000 Expenditure</b>	<b>11.73</b>
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## Non Hydrographic Office Expenditure

Hydrographic Office Salaries (Uniform & Civilian)	4.03
Other Estimated Hydrographic Expenditure (see note)	38.00

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<b>Estimated Total Non Hydrographic Office Expenditure</b>	<b>42.03</b>
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<b>Estimated Net Total Hydrographic Function</b>	<b>53.76</b>
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*Note: Includes estimated expenditure for Ship Operations, Hydrographic School, Uniformed Staff on General Service etc.*

## A-2

## Finance And Accounts

## Chart Revenue

## DISTRIBUTION OF CHARTS AND ASSOCIATED PUBLICATIONS

		1993-94*	1994-95*	1995-96
Australian	Issued	25,456	28,164	25,427
	Sold	103,844	108,839	112,443
British Admiralty	Issued	10,973	11,620	11,348
	Sold	5,262	3,877	981
New Zealand	Issued	1,460	2,375	1671
	Sold	426	384	22
<b>Total</b>		<b>147,421</b>	<b>155,259</b>	<b>151,892</b>

## VALUE OF CHARTS AND ASSOCIATED PUBLICATIONS SOLD

(Exclusive of Sales Tax)

	1993-94*	1994-95*	1995-96
Australia	\$1,317,808	\$1,333,267	\$1,467,293
British Admiralty	\$130,011	\$98,991	\$28,519
New Zealand	\$6,291	\$5,703	\$336
<b>Total</b>	<b>\$1,454,110</b>	<b>\$1,437,961</b>	<b>\$1,496,148</b>

## REVENUE SUMMARY

	1993-94	1994-95	1995-96
Net Sales	\$1,456,312	\$1,439,827	\$1,475,561
Sales tax	\$89,555	\$95,864	\$104,446
Freight & Sundries	\$262	\$246	\$1,081
<b>Total Revenue</b>	<b>\$1,546,129</b>	<b>\$1,535,937</b>	<b>\$1,581,087</b>
Value of Issued Stock	\$635,281	\$754,752	\$757,581

## Charts sold by the UK Hydrographic Office:

220 Australian charts reprinted by UK Hydrographic Office, with 44,000 charts sold.

\* The quantity/values data has been revised to include several Defence Products which were not included with the RANHO Annual Reports for FY1993/94 or 1994/95.



**Annex B****Activities****Surveys Undertaken (July 1995 - June 1996)**

<b>Unit(s)</b>	<b>Hydrographic Instruction</b>	<b>Location</b>	<b>Area Sounded (nm2)</b>
HMAS MORESBY	HI223 & 234	Approaches to Port Lincoln & Investigator Strait, SA	168
	HI213 & 214	Sahul Banks & Melville Island South Coast, NT	572
HMAS FLINDERS	HI229 & 230	Shoalwater Bay & Northern Approaches to Gladstone, QLD	485
	HI239	Bligh Entrance, Torres Strait, QLD	502
HMA Ships MERMAID and PALUMA	HI231	One Mile Opening, QLD	47
	HI236	Torres Strait, QLD	310
HMA Ships SHEPPARTON and BENALLA	HI228	Karumba, QLD	394
	HI238	Fairway Channel, QLD	46
LADS Unit	HI220	Cooks Passage to Trinity Opening, QLD	629
	HI221	Cape Weymouth to Blackwood Channel, QLD	359
	HI222	Torres Strait, QLD	365
	HI235	Sahul Banks, NT	1180
	HI241	Hope Islands to Larks Pass, QLD (ongoing, continuation of HI220)	136
	HI214A	Middleton & Elizabeth Reefs, Tasman Sea	39
	Reconnaissance	Sahul Banks NT, Bunker Reef QLD & Hibernia Passage, QLD	80
	Kangaroo 95	Groote Eylandt, NT	12
HODSU	Beachcomber 95	Northern WA	16
	HI226	Swallows Landing, QLD	4
	HI227	Approaches to Davis, Antarctica	124
<b>TOTAL</b>			<b>5468</b>

**B-2****Activities****Chart Production And Maintenance**

	<i>1993/94</i>	<i>1994/95</i>	<i>1995/96</i>
<b>New Chart Production</b>			
New Charts published	13	10	13
New Editions published	10	7	2
New charts/diagrams for RAN use	11	17	3
Miscellaneous charts	5	5	2
<b>Chart Maintenance</b>			
Notice to Mariner block corrections	23	23	33
Revisions by reprinting	178	192	163
Revisions by screen printing	83	30	46
Miscellaneous graphics	9	17	62

**B-3****Activities****Description Of New Charts Published**

The information shown on all new charts is contained in the Hydrographic Chart Digital Database.

**Aus 716 Gugari Rip to Cadell Strait including Arnhem Bay (WA), 1:150 000**

This coastal navigational chart was initially programmed to meet fleet operational needs but then became a normal charting task. It is based on modern vertical and horizontal datums and is derived from RAN surveys of 1922-93.

**Aus 383 Bonvouloir Island to Woodlark Island (PNG), 1:300 000**

A new chart based on modern vertical and horizontal datums which replaces former chart Aus 383 of Imperial units published in 1971 and which was produced as part of the charting agreement with Papua New Guinea. The limits were revised to conform with this scale Series and it incorporates the recently published Aus 514 with RAN surveys of 1944-90 and additional data from soundings on passage.

**Aus 323 Adele Island to Lacedpede Island, including King Sound (WA), 1:300 000**

A new chart based on modern vertical and horizontal datums which replaces the former Aus 323 of imperial units published in 1967. This chart completes the NW block (WA) commenced in 1989 and consists of the main chart with a plan of Beagle Bay. It incorporates RAN and RN surveys to 1977, with additional data from national bathymetric and seismic surveys as well as soundings on passage.

**Aus 18 Port Essington (NT), 1:100 000**

A new chart based on modern vertical and horizontal datums, which replaces the ungraduated Aus 18 of Imperial units (Mod Rep 1978), and which was compiled from RAN surveys 1945-95 with additional data from national bathymetric surveys.

**Aus 69002 Conundrum Island Group (Fictitious), 1:25 000**

A new fictitious fleet chart for the specific use of training on the Submarine Simulator at HMAS WATSON.

**Aus 69003 Approaches to Conundrum Island Group (Fictitious), 1:75 000**

A new fictitious fleet chart for the specific use of training on the Submarine Simulator at HMAS WATSON.

**Aus 612 Plans in the Coral Sea (Sheet 1)**

This new chart based on modern vertical and horizontal datums replaces the former BA 349 of Imperial units published in 1863. These plans are derived from an RAN survey of 1992 together with national bathymetric surveys and passage soundings. Coverage is of Saumarez and Frederick Reefs.

**Aus 621 Approaches to Port Moresby (PNG), 1:37 500**

A new chart based on modern vertical and horizontal datums, replacing former chart Aus 621 of imperial units published in 1949, and which was produced as part of the charting agreement with Papua New Guinea. The limits, scales and plans were revised in conjunction with the authorities in Port Moresby to suit their shipping needs. It consists of the main chart and 2 plans and the data used is from RAN surveys of 1937-91, PNG authority surveys 1964-83 with the remaining data from other survey organisations and soundings on passage.

**Aus 260 Broad Sound Channel and Shoalwater Bay (QLD), 1:75 000**

A new chart based on modern vertical and horizontal datums, with limit changes to meet fleet requirements. It replaces the former Aus 260 published 1990, with amendments from an RAN survey of 1995.

**Aus 60260 Broad Sound Channel and Shoalwater Bay (QLD), 1:75 000**

A new fleet version of chart Aus 260, based on modern vertical and horizontal datums with changes to its coverage to incorporate existing Aus 60266, thus eliminating the use of two charts during exercises.

**Aus 5950A Australian Exclusive Economic Zone (Northern Sheet), 1:10 000 000**

A new chart specifically for the portrayal of Territorial and International Boundaries within Australian waters.

**Aus 710 Vanderlin Island to Cape Beatrice (NT), 1:150 000**

A new coastal navigational series chart which was produced primarily to give approach detail to the new Bing Bong ore loading facility. It is based on modern vertical and horizontal datums, and is derived from RAN surveys of 1923-95 together with a BA survey of 1803 and company contracted surveys of 1966-1994.

**Aus 801 Cape Schank to Cape Liptrap (Vic), 1:150 000**

A new coastal navigational series chart based on modern vertical and horizontal datums which replaces the eastern section of former Aus 788 of Imperial units published in 1958. It is compiled from RAN surveys of 1953-85 and BA surveys of 1868-1886.

**Aus 617 Plans in the Coral Sea (Sheet 5)**

This new chart based on modern vertical and horizontal datums replaces part of former BA 349 of Imperial units published in 1863. These plans are derived from RAN surveys of 1985-90, national bathymetric surveys of 1988 and passage soundings. Coverage is of Willis Islets and Coringa Islets to Magdelaine Cays.

**Aus 799 Stony Head to Rocky Cape (Tas), 1:150 000**

A new chart based on modern vertical and horizontal datums which replaces former chart Aus 799 of Imperial units published in 1948. It is derived from RAN surveys of 1946-88 and national bathymetric surveys of 1985.

**Aus 788 Cape Otway to Cape Schank (Vic), 1:150 000**

A new coastal navigational series chart based on modern vertical and horizontal datums which replaces the western section of former Aus 788 of Imperial units published in 1958. It is compiled from RAN surveys of 1953-86, BA surveys of 1863-1867, Port of Melbourne Authority plans 1952-91 and national bathymetric surveys of 1985-85.

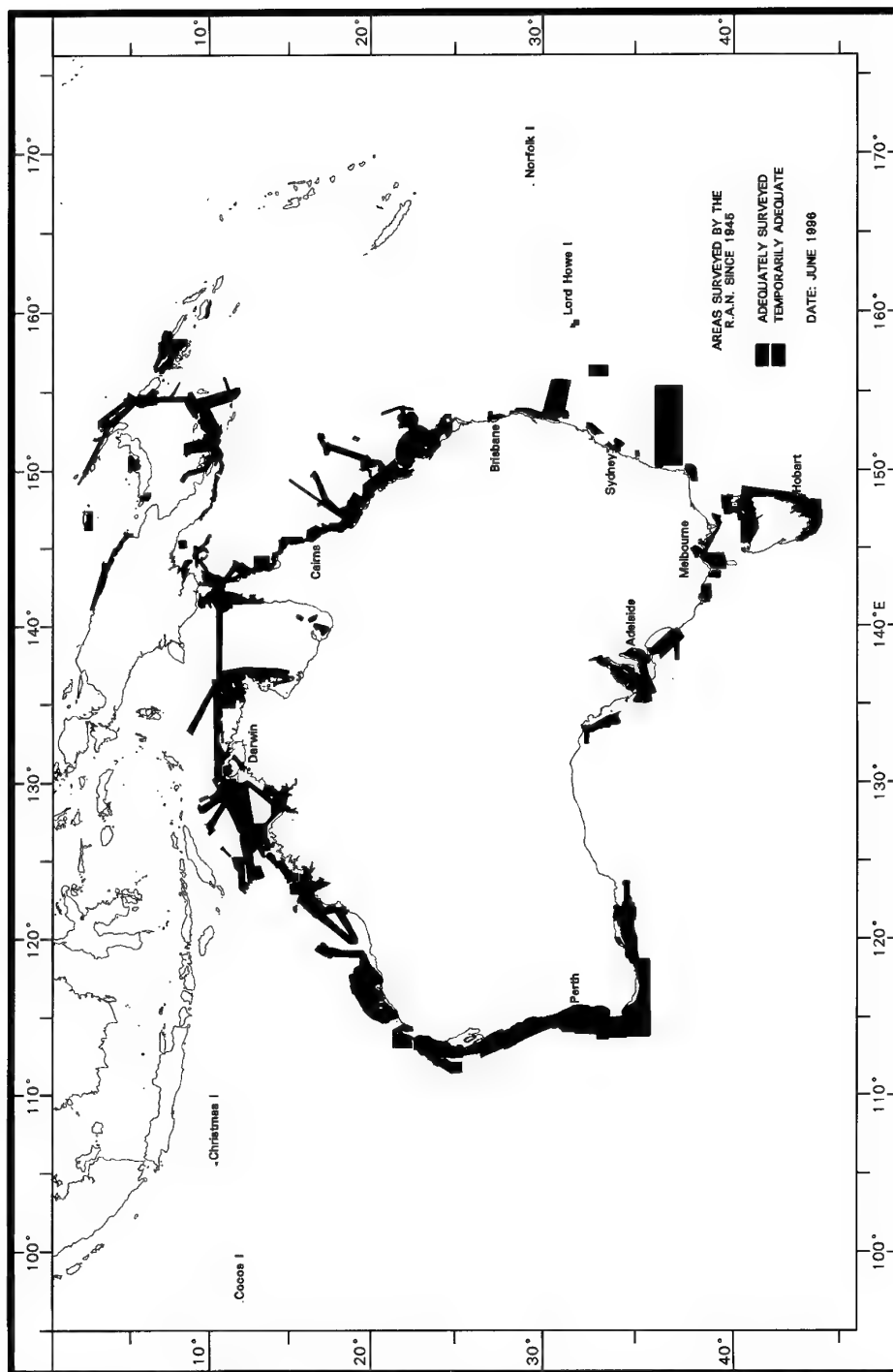
**B-4****New Editions Published****Aus 208 Newcastle Harbour (NSW), 1:7 500**

A new edition of the existing chart incorporating berth, channel and navigational aids amendments as per Newcastle Port Corporation plans of 1993-95.

**Aus 32 Cambridge Gulf (WA), 1:75 000**

A New Edition of the existing chart based on modern vertical and horizontal datums incorporating new RAN survey of 1994 together with Western Australian Department of Transport plans to 1994.

Figure 1 • Survey Coverage



### Figure 2 • Surveys Undertaken 1995-96

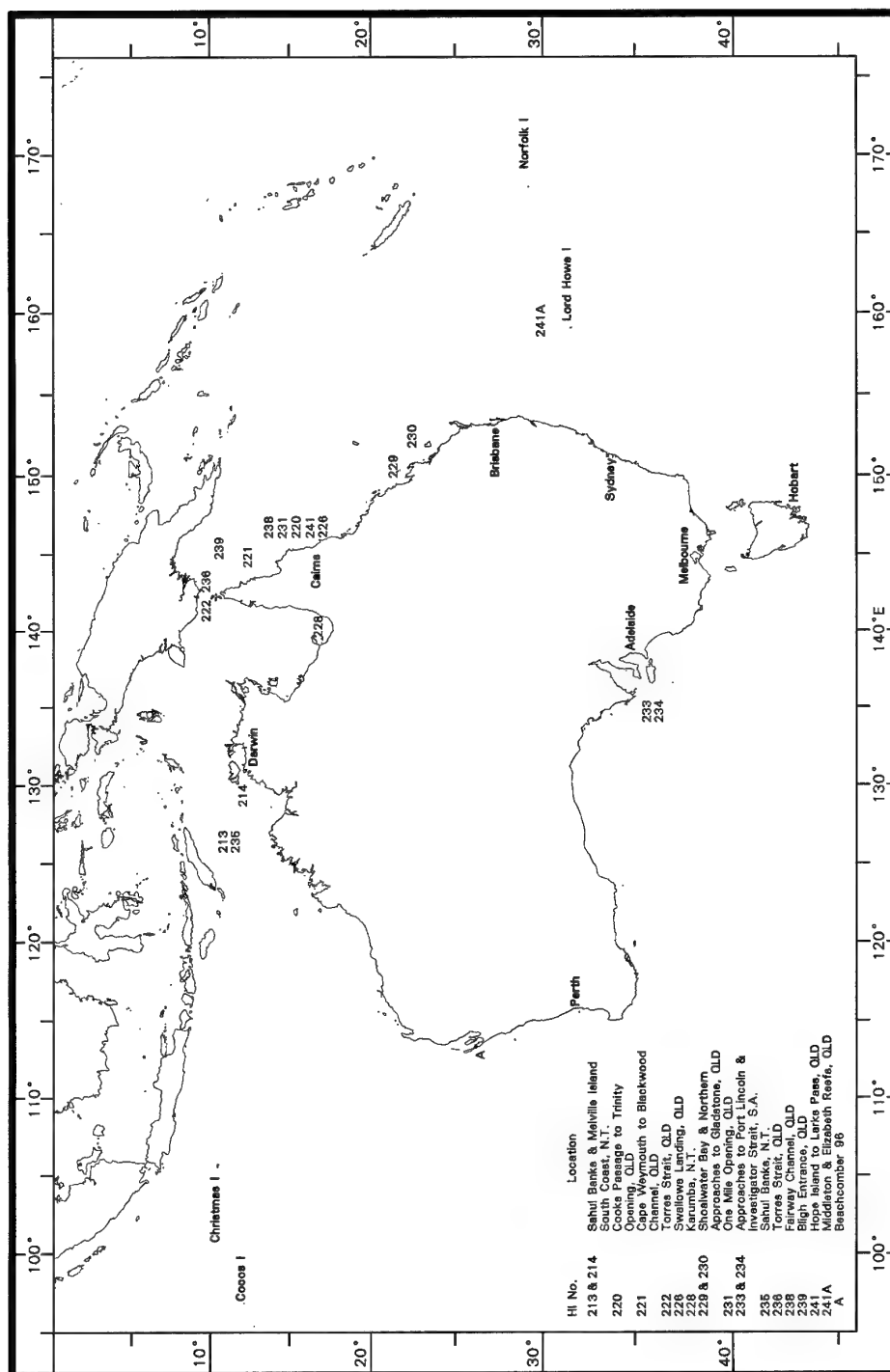


Figure 3 • Charts Published 1995-96

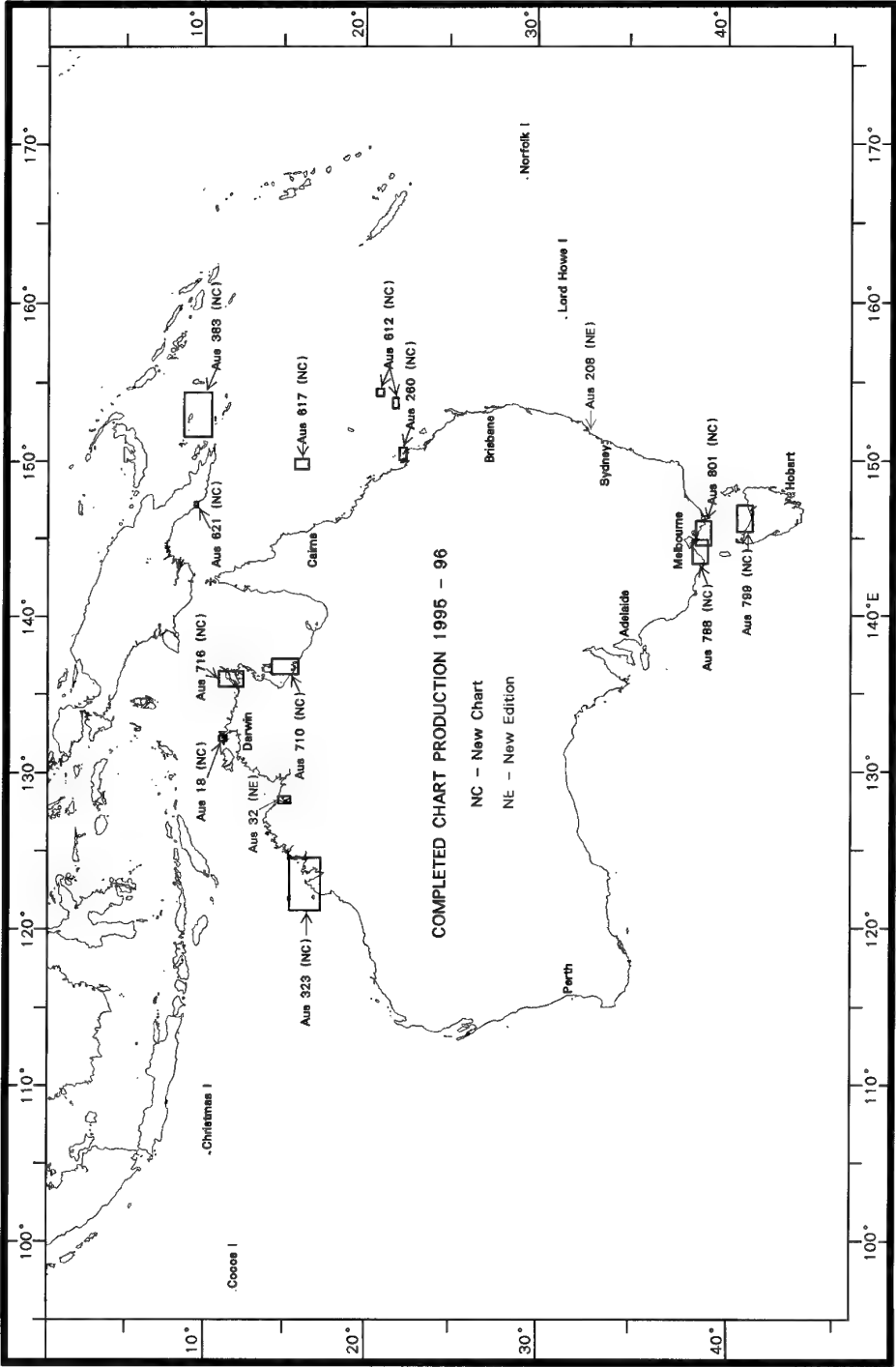
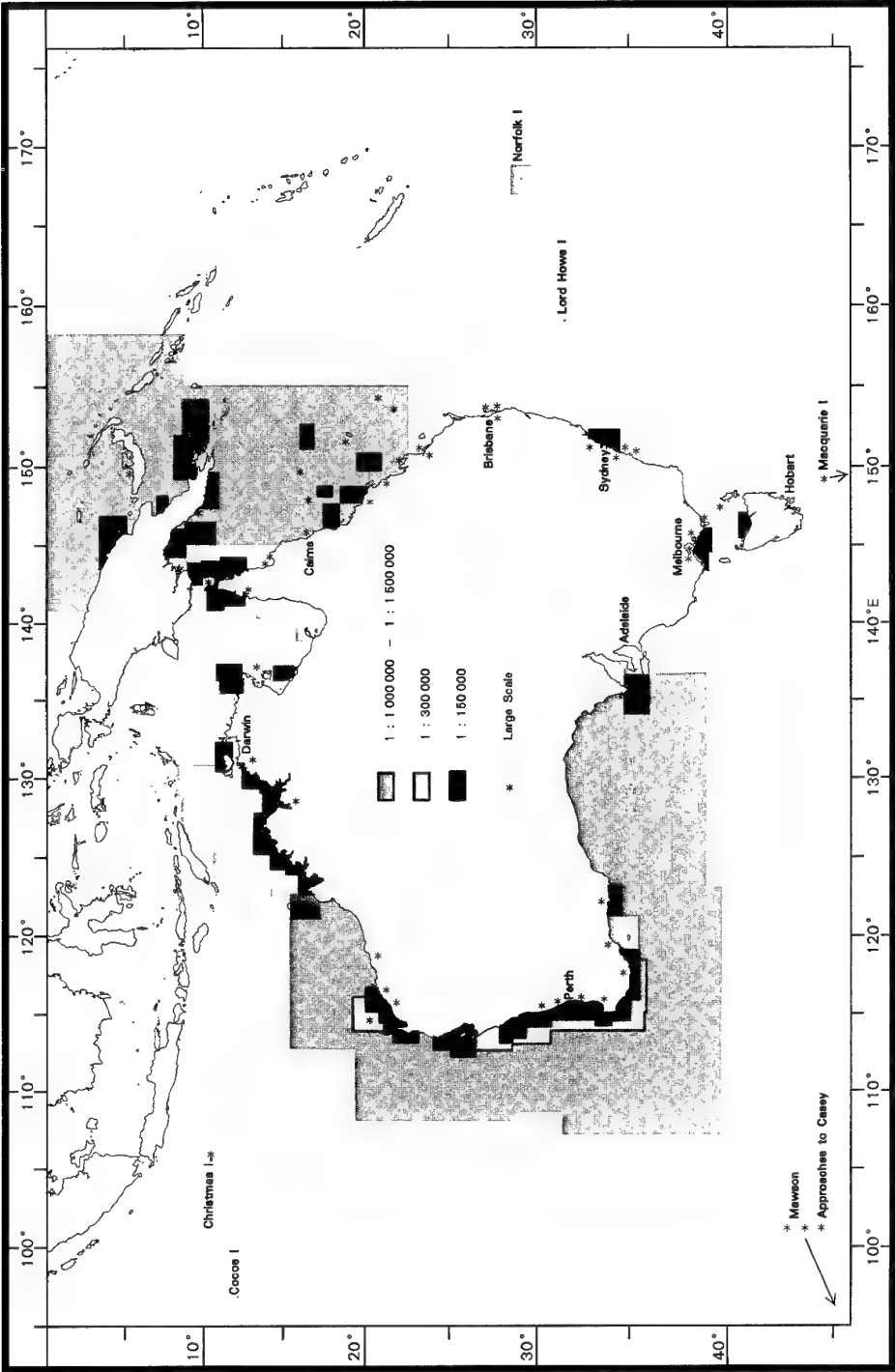




Figure 4 • Digital Chart Coverage



**Annex C****Chart Scheme Statistics At 30 June 96**

<i>Category / Scale</i>	<i>Published Imperial</i>	<i>Published Metric</i>	<i>Total Published</i>	<i>Planned Total</i>
<b>Australia</b>				
Larger than 1:25,000	4	19	23	29
1:25,000 - 1:100,000	11	66	77	154
1:101,000 - 1:300,000	56	98	154	214
Smaller than 1:300,000	13	16	29	55
Sets of Plans	5	21	26	46
<b>Antarctica</b>				
Larger than 1:25,000		1	1	1
1:25,000 - 1:100,000		3	3	3
1:101,000 - 1:300,000				1
Smaller than 1:300,000	1	3	4	5
Sets of Plans				0
<b>Papua New Guinea</b>				
Larger than 1:25,000	2		2	3
1:25,000 - 1:100,000	15	3	18	30
1:101,000 - 1:300,000	15	10	25	80
Smaller than 1:300,000	3		3	7
Sets of Plans	5		5	7
<b>Totals</b>	<b>130</b>	<b>240</b>	<b>370</b>	<b>635</b>

*Note: The above format has been altered from previous years to conform with the International Hydrographic Organisation's reporting format.*

**Chart Datum Statistics**

Horizontal Datum - Number of charts published

Pre AGD 66	92
AGD 66	194
WGS 84	71
INT series charts	13

Vertical Datum - Number of charts published

ISLW	179
LAT	150
Other	41

## Annex D

## Notices To Mariners

Notices to Mariners key indicators for the 1995-96 period were:

	1993-94	1994-95	1995-96
Notices to Mariners issued	640	595	640
Block corrections for charts	23	23	33
Notes for charts	91	28	67
Reproduction of BA blocks/diagrams	1	5	9
Reproduction of BA notes	11	9	5
Reproduction of NZ blocks/diagrams	nil	8	7
Reproduction of NZ notes	48	64	9
Hydrographic notes from HMA Ships	108	96	62
Hydrographic notes from other sources	30	27	45

Vessels and others (excluding Hydrographic Survey Force ships) rendering Hydrographic Notes during the year were:

Mr N H Coates	MV Wauri
Mr R J Hardstaff	SV Windclimber
Mr P Dunne	SV Namanda II
Mr ER Whitmore	SV Yorree
MV Anro Temasek	MSA Bermagui
MV Australian Advance	HMAS Bendigo
MV Australian Venture	HMAS Brunei
MV Bunga Terasek	HMAS Bunbury
MV City of Port Melbourne	HMAS Canberra
MV Clydebank	HMAS Cerberus
MV Coringale Bay	HMAS Dubbo
MV Eva	HMAS Gawler
MV Fourcroy	HMAS Geelong
MV Glenda Lee	HMAS Launceston
MV Iron Chieftain	HMAS Perth
MV Iron Prince	HMAS Platypus
MV Iron Shortland	HMAS Protector
MV Lady Jane	HMAS Townsville
MV Lantau Trader	HMAS Westralia
MV Moraybank	HMAS Wollongong
MV Osco Star	HMPNGS Buna
MV Pacific Marlin	HMNZS Charles Upham
MV Petro Trader	Vanuatu Hydrographic Department
MV Rangitikei	STS Young Endeavour
MV Vast Jollity	

**Annex E****Contributions And Acknowledgments**

Acknowledgment is made to the following organisations which supplied data to the Hydrographic office on an exchange or voluntary basis:

Antarctica	AUSLIG
Northern Territory	Department Of Transport And Works Fluor Daniel Australia Ltd
New South Wales	Federal Airports Corporation Newcastle Ports Corporation Sydney Ports Corporation Waterways
Queensland	ATSIC Gladstone Port Authority Port of Brisbane Authority Queensland Transport Townsville Port Authority Venture Explorations NL
South Australia	Ports Corporation South Australia
Western Australia	Ampolex Ltd BHP Department of Transport Woodside Offshore Petroleum
Victoria	Port of Victoria
Tasmania	Launceston Port Authority Marine Board of Hobart Westham Dredging Company
Papua New Guinea	Freiberg University of Mining and Technology Kinhill Engineers Papua New Guinea Harbours Board

**Annex F****Key Staff at 30 June 1996****Hydrographer**

Personal Assistant

CDRE R.J. Willis RAN

Miss P.M. Beams

**Operations and Survey**

Director Hydrographic Operations

CMDR M.A. Hudson RAN

Head Operations and Surveying

CMDR R.R. Nairn RAN

**Charting Services**

Head Nautical Charting

Mr I.K. Kennedy

Head Navigational Services

Mr M.A. Bolger

Manager Information Services

Mr A.L. Larden

Manager Chart Distribution

Mr N.J. Gillin

**Co-ordination and Development**

Director Co-ordination and Development

Mr K.G. Burrows, OAM

Head Branch Transition

Mr R.A. Furness

Manager Corporate Services

Mr J.A. Hodges

Manager Hydrographic Development

LCDR P.R. Johnson RAN

Manager Branch Development

Mr B.T. Rowland

Head Computing Services

Mr R.J. Westaway

Manager National and International Affairs

Mr J.S. Randhawa

Manager Financial Resources

Mr A. Philpott

Human Resource Manager

Miss C.V. Shepherd

**Canberra**

Hydrographic Projects Officer

LCDR C.K. Ellis RAN

**Hydrographic Survey Force**

HMAS MORESBY

CMDR P.A. Spencer RAN

HMAS FLINDERS

LCDR J.W. Maschke RAN

HMAS PALUMA

LEUT M.J. Beard RAN

HMAS MERMAID

LCDR G.R. Cann RAN

HMAS SHEPPARTON

LCDR N.S. Lemon RAN

HMAS BENALLA

LEUT M.R. Houston RAN

LADS UNIT

CMDR M.J. Sinclair RAN

HODSU

LEUT M.A.R. Matthews RAN

**Naval Training Command**

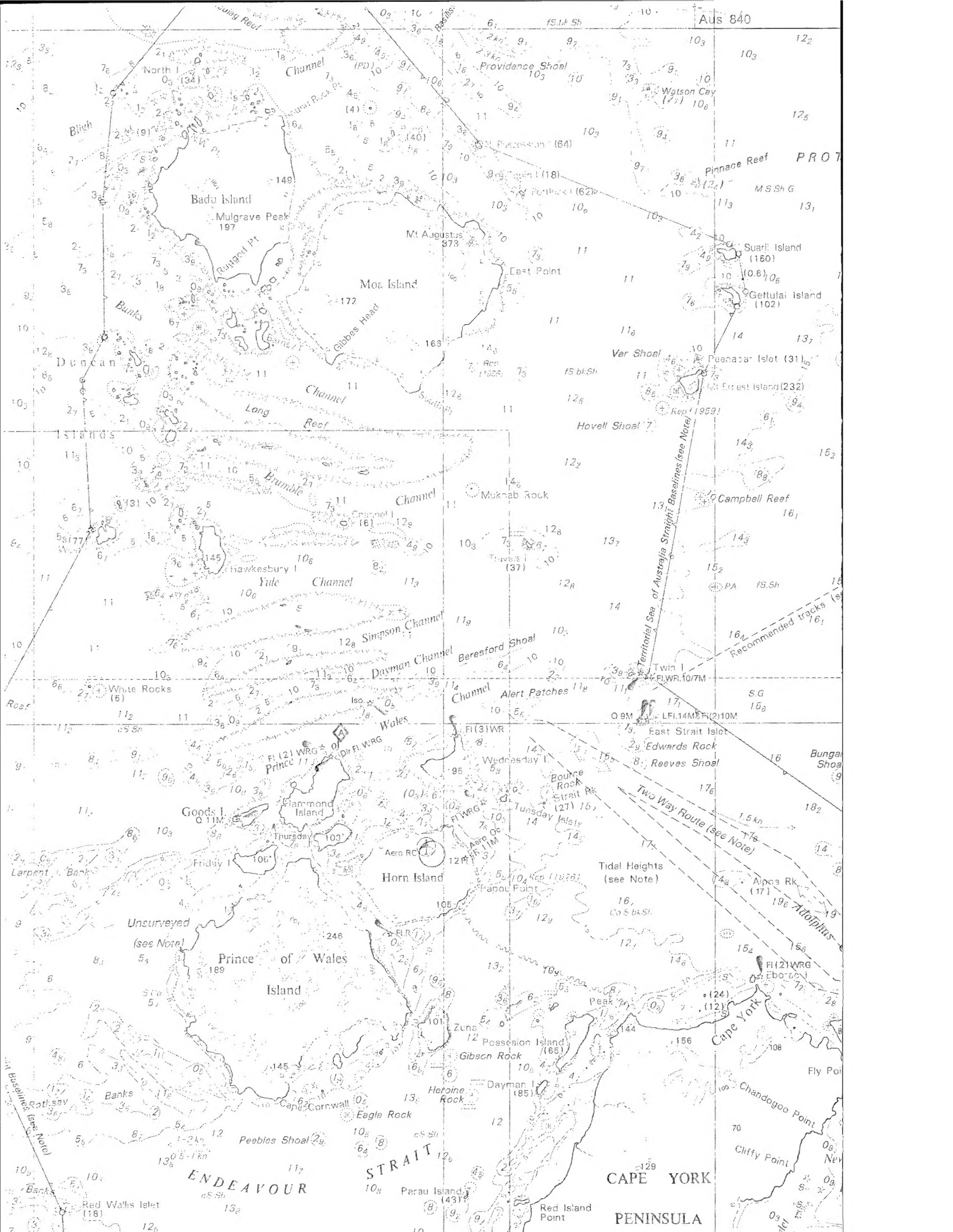
Hydrographic School HMAS PENGUIN

LCDR K.J. Mc Gregor RAN



The RAN Hydrographic Service will release a CD-ROM, containing about 100 charts during FY 96/97. The CD-ROM will be used in a number of Electronic Charting Systems (ECS) which are coming onto the market. Almost all the RAN Charts will be available on CD in addition to the traditional paper format before the end of 1997.

The Service is also actively engaged in the production of electronic chart data used in ECDIS (Electronic Chart Display Information System).





## ADDRESSES

### WOLLONGONG

RAN Hydrographic Office  
8 Station Street  
WOLLONGONG NSW 2500  
  
Locked Bag 8801  
South Coast Mail Centre NSW 2521  
  
Telephone: (042) 218 500  
Facsimile: (042) 218 599  
Signal: HYDRO RAN

### CANBERRA

Hydrographic Projects Officer  
PO Box E33  
Queen Victoria Terrace  
CANBERRA ACT 2600  
  
Telephone: (06) 266 2587  
Facsimile: (06) 266 2975

### FIELD UNITS

HMAS MORESBY  
Warship Section  
ROCKINGHAM WA 6958  
Phone: (09) 500 411

HMA Ships FLINDERS,  
MERMAID, PALUMA,  
SHEPPARTON, BENALLA  
c/o HMAS CAIRNS  
Draper Street  
CAIRNS QLD 4870  
Phone: (070) 50 3311

### LADS

P.O. Box 316N  
CAIRNS NORTH QLD 4870  
Phone: (070) 359 376  
Facsimile: (070) 359 469

### TRAINING SCHOOL

RAN Hydrographic School  
HMAS PENGUIN  
Middle Head Road  
Mosman NSW 2090  
Phone: (02) 960 0264